buck technology. The corresponding exemplary buck regulator embodiment shown in Figure 7 includes the appropriate suffixes (e.g., "1" and "2") to designate a component regulating the principal supply voltage and the secondary supply voltage to track the first or second input voltage required values, respectively. While shown schematically as being logically separate, the components of regulator circuits 310 and 315 may be implemented using one or more of the same components, or different components, without departing from the scope of the present invention.

IN THE CLAIMS:

Claims 7 - 12, and 21 have been cancelled, without prejudice. Claims 31 and 32 have been added. Claims 1 - 6, 13, 15 - 19, 22 - 26, and 28 - 30 have been amended, as follows:

1. (Amended) A power supply system, comprising:

a controller configured to cause a regulator to produce a principal supply voltage and a secondary supply voltage, said regulator for coupling to a power source and to a microelectronics device to supply said principal supply voltage and said secondary supply voltage to said microelectronics device; and

wherein said controller is further configured to maintain said principal supply voltage within a tolerance level bounded at a principal supply upper limit by a first reliability voltage value and bounded at a principal supply lower limit by a second reliability voltage value, and to maintain said secondary supply voltage within a second tolerance level bounded at a secondary supply upper limit by the first reliability voltage value and bounded at a secondary supply lower limit by a

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third reliability voltage value.

2. (Amended) The system of claim 1, wherein the controller causes said regulator to produce a third supply voltage and the controller is configured to maintain said third supply voltage within a third tolerance level bounded at a third supply upper limit by a first reliability voltage value and bounded at the third supply lower limit by a fourth reliability voltage value.

3. (Amended) The system of claim 1, wherein the principal supply voltage and the secondary supply voltage are determined in accordance with a gain factor in accordance with a voltage-current loadline.

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4. (Amended) The system of claim 3, wherein said controller is further configured to determine said gain factor as required to produce the principal supply voltage and the secondary supply voltage according to said voltage-current loadline and said voltage-current loadline specifies a linear relationship.

5. (Amended) The system of claim 3, wherein said controller is further configured to determine said gain factor as required to produce the principal supply voltage and the secondary supply voltage according to said voltage-current loadline and said voltage-current loadline specifies a total power voltage-current relationship.

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6. (Amended) The system of claim 3, wherein said controller is further configured to determine said gain factor in order to produce the principal supply voltage and the secondary supply voltage according to said voltage-current loadline and said voltage-current loadline specifies a non-linear relationship and said non-linear loadline further includes a discontinuity corresponding to an immediate current value between zero and a maximum.

13. (Amended) A regulator, comprising:

at least two regulator circuits, each said regulator circuit for coupling to a microelectronics device to provide a plurality of regulated input voltages to said microelectronics device, wherein each said regulator circuit provides a particular one of said regulated input voltages to said microelectronics device;

wherein each said regulator circuit further includes: output

a controller including a comparator and a threshold detector, an input of said comparator being coupled to the output of said threshold detector,

a switch coupled to said controller and operating in response to a signal provided by said controller, said switch connected to an inductor, a diode, and an output capacitor arranged in a network that produces a load current in response to an input source voltage received via said switch, and

a current sense feedback network connected to said network output and having a gain factor, said feedback network coupled to said threshold detector to cause said threshold detector to produce an output signal as a product of said gain factor,

wherein said controller is configured to produce one of said plurality of said regulated input voltages by varying the duty cycle of said switch in accordance with a voltage current loadline,

wherein said controller is further configured to maintain said one of regulated input voltages within an input voltage range bounded [by a constant] at an upper limit by a first reliability voltage value and bounded *at* a lower limit, and

wherein said lower limit for said one of said plurality of regulated input voltages is computed by said controller in order to maintain said one of said plurality of regulated

input voltages in accordance with said voltage-current loadline of said one of said plurality of regulated input voltages for different values of said load current.

15. (Amended) The regulator of claim 13, wherein said voltage-current loadline specifies a linear relationship.

16. (Amended) The regulator of claim 13, wherein said controller computers a gain factor for said one of said plurality of regulated input voltages in order to maintain said one of said plurality of regulated input voltages according to a total power voltage-current loadline.

17. (Amended) The regulator of claim 14, wherein said voltage-current loadline specifies a non-linear relationship.

18. (Amended) The regulator of claim 17 wherein said voltage-current loadline with a non-linear relationship includes a discontinuity corresponding to an immediate current value between zero and a maximum associated with said microelectronics device.

19. (Amended) An electronic system, comprising:

a microelectronics device having at least two input voltage required values to receive at least two input supply voltages;

a regulator coupled to said microelectronics device; and

a power source coupled to said regulator;

wherein said regulator is configured to produce said at least two supply voltages within an input voltage range bounded by an upper limit and a lower limit;

wherein said upper limit of each of said at least two input supply voltages is a first reliability voltage value; and

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wherein said lower limit of each of said at least two input supply voltages is determined by a gain factor multiplied by each of said at least two input supply voltage required values.

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22. (Amended) The electronic system of claim 19, wherein said regulator is further configured to determine said gain factor for each of said at least two input supply voltages according to a voltage-current loadline, and wherein said lower limit for each of said at least two input supply voltages is equal to the product of one minus a tolerance level multiplied by a corresponding one of the at least two input supply voltage required values.

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23. (Amended) The electronic system of claim 19, wherein said regulator adjusts said gain factor to produce said at least two input supply voltages according to a voltage-current loadline, and wherein said loadline specifies a total power voltage current relationship.

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24. (Amended) The electronic system of claim 19, wherein said regulator adjusts said gain factor to produce said at least two input supply voltages according to a voltage-current loadline, and wherein said loadline specifies a non-linear relationship.

25. (Amended) The electronic system of claim 24, wherein said non-linear relationship includes a discontinuity corresponding to an intermediate current value between zero and a maximum, associated with said microelectronics device.

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26. (Amended) A regulating method, comprising:

supplying multiple input voltages to one or more microelectronics devices, each of said multiple input voltages including a corresponding input voltage required value;

determining a lower limit of a voltage regulation range for said multiple input

A7 Nob. B8 voltages in accordance with a corresponding voltage-current loadline; and

maintaining each of said multiple input voltages supplied to said microelectronics devices above said lower limit of said voltage regulation_range and under said first reliability voltage.

28. (Amended) The method of claim 26, wherein said determining further includes selecting a gain factor in order to produce said multiple input voltages according to said corresponding voltage-current loadline, wherein said corresponding voltage-current loadline specifies a linear relationship and

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29. (Amended) The method of claim 28, wherein said determining further includes adjusting a gain factor as required to produce said multiple input voltages according to said corresponding voltage-current loadline, where said corresponding voltage-current loadline is a total power voltage-current loadline.

30. (Amended) The method of claim 28, wherein said determining further

Nob. B9 includes adjusting a gain factor as required to produce said multiple input voltages according to said corresponding voltage-current loadline, where said corresponding voltage-current loadline specifies a non-linear relationship.

31. (New) The power supply system of claim 1, wherein said second

A9 reliability voltage value is determined by multiplying one minus said tolerance level by a first input voltage required value and said third reliability voltage value is determined by multiplying one minus said second tolerance level by a second input voltage required value.

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32. (New) The regulator of claim 13, wherein said lower limit for said one of a plurality of regulated input voltages is determined by multiplying one minus a tolerance level by a corresponding one of a plurality of input voltage required values.